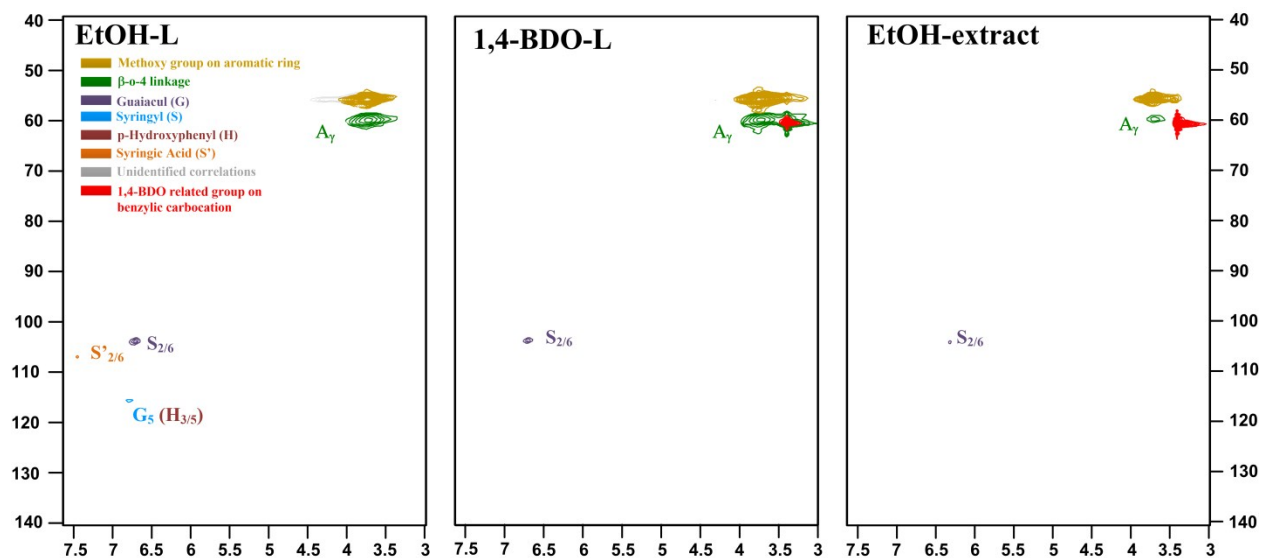
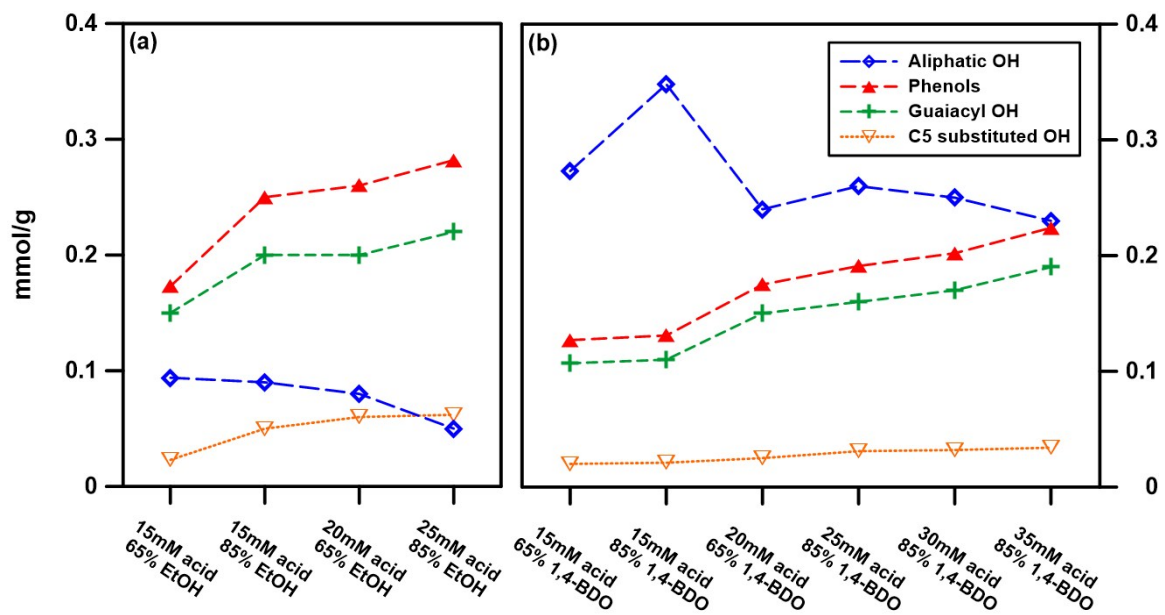


**Fig. S1** Gas chromatogram of EtOH (15 mM acid and 65% EtOH) and 1,4-BDO (15 mM acid and 65% 1,4-BDO) dissolved lignin.



**Fig. S2** 2D HSQC NMR spectra from pretreated lignin. Abbreviation was depicted in Fig. 2.



**Fig. S3** Hydroxyl groups of soluble lignin at different pretreatment severities using EtOH and 1,4-BDO